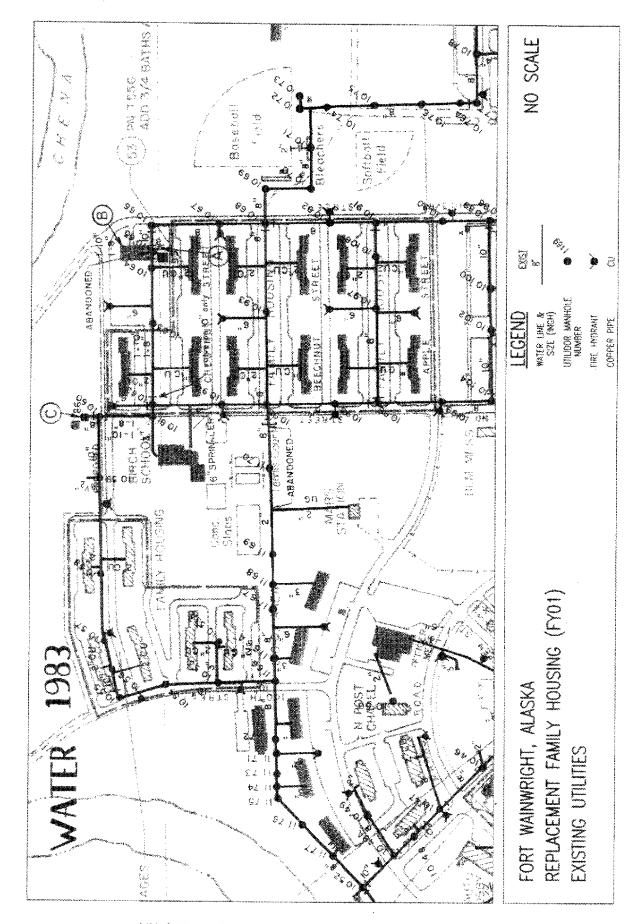
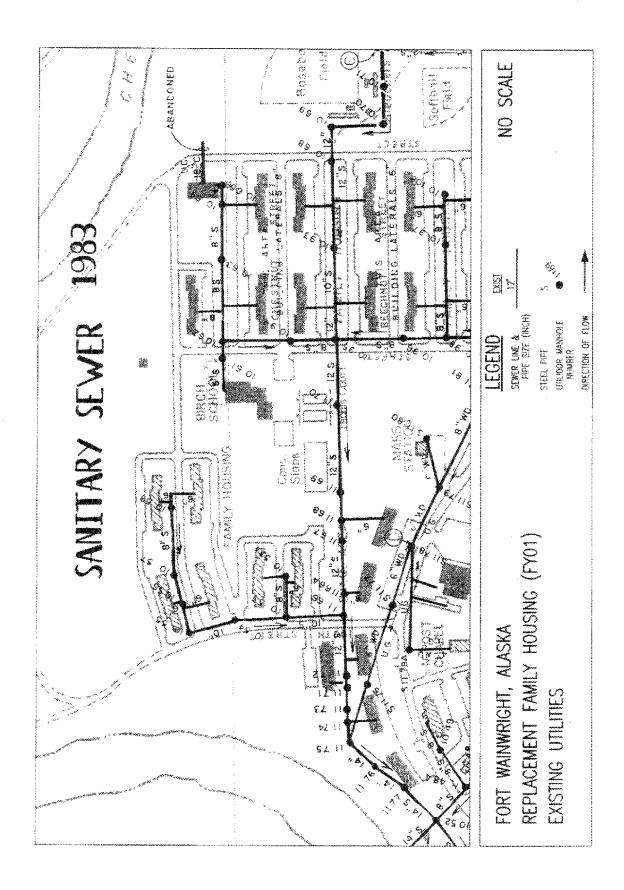
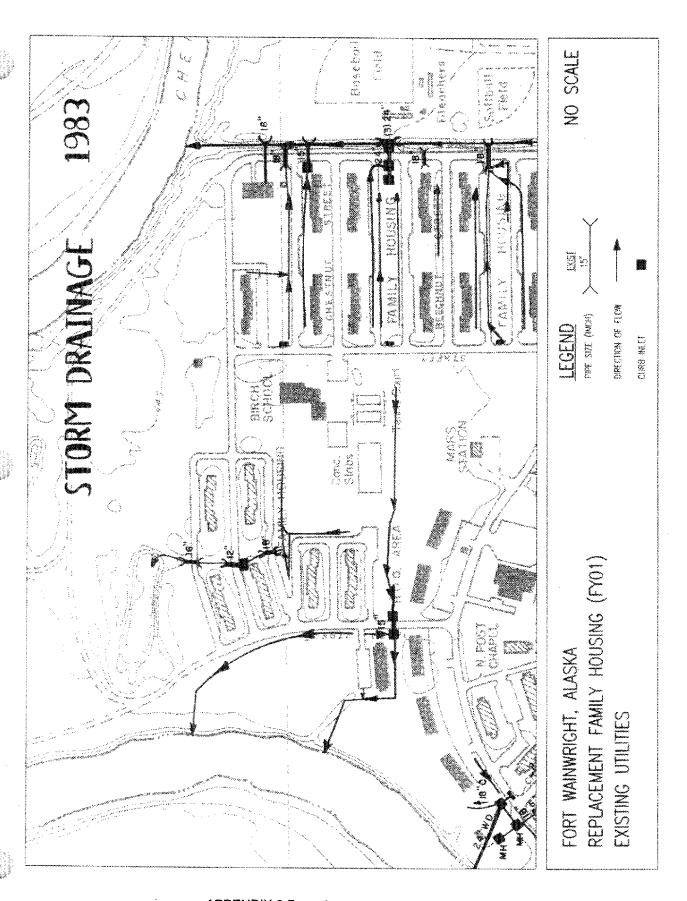


APPENDIX 3 Page 1

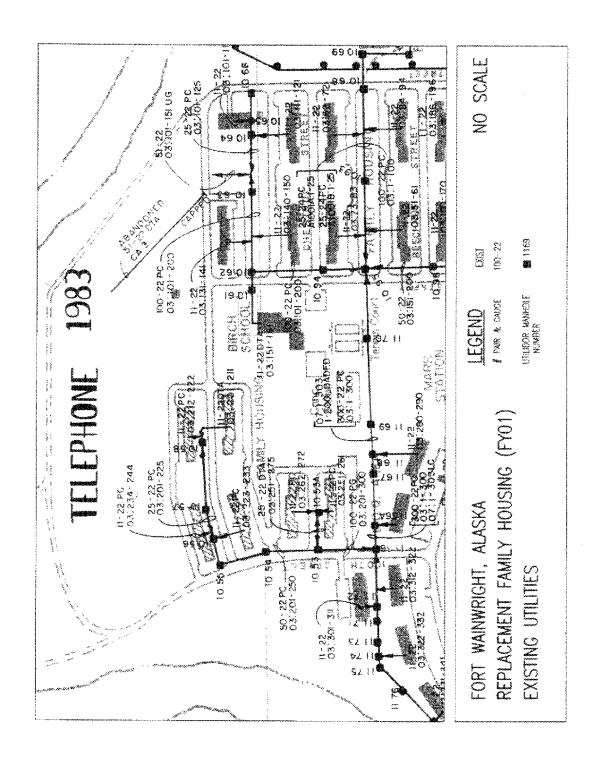


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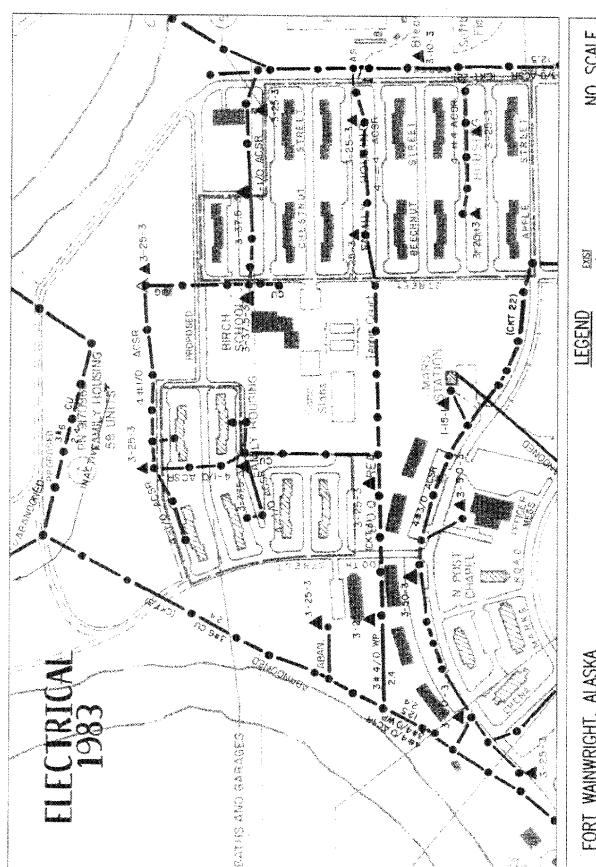




APPENDIX 3 Page 4

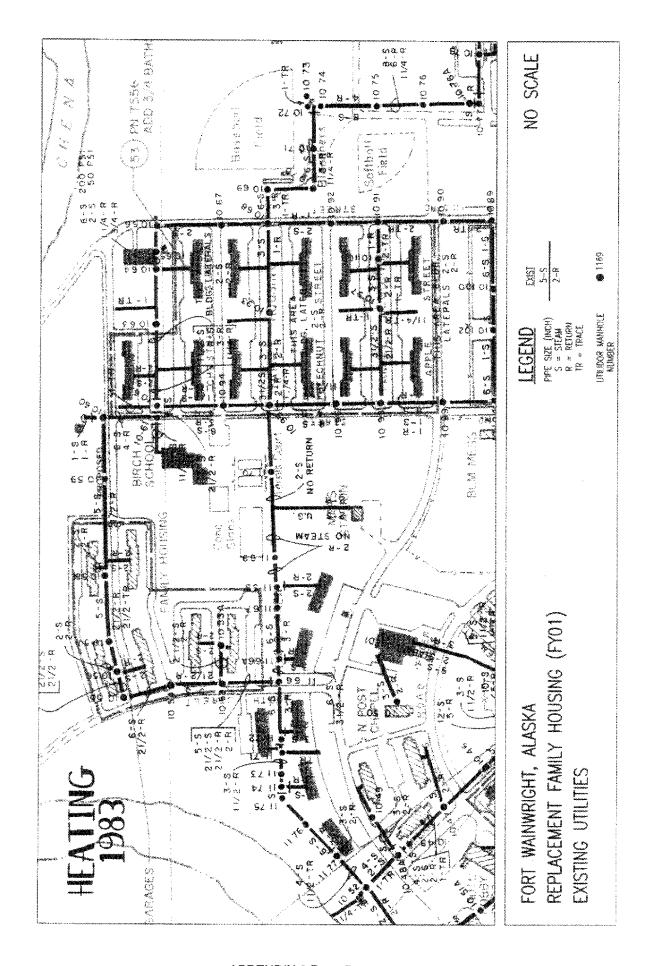


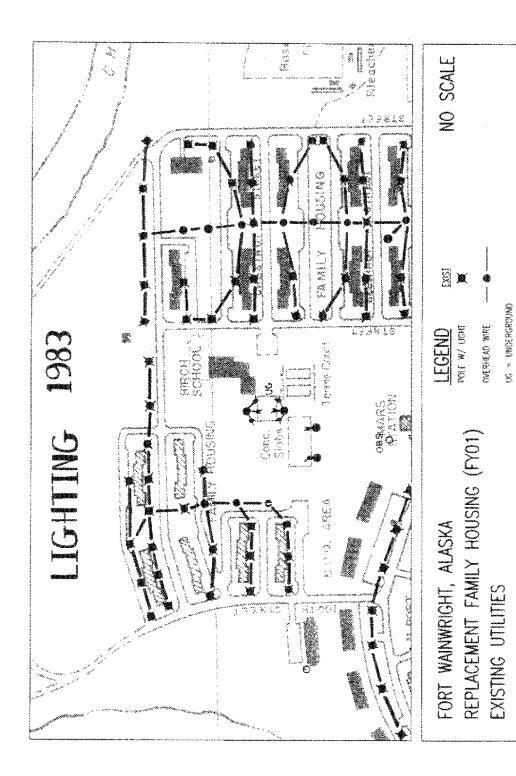
APPENDIX 3 Page 5



NO SCALE # 24/0 ACSP ABAN. (CKT 22) WASE SUZE & TYPE ASMINOMED REPLACEMENT FAMILY HOUSING (FY01) FORT WAINWRIGHT, ALASKA EXISTING UTILITIES

APPENDIX 3 Page 6





--End of Appendix 3--

GEOTECHNICAL FINDINGS REPORT for the **FAMILY HOUSING UPGRADE (FTW230)** FT. WAINWRIGHT, ALASKA

March 2001

1. Introduction

This geotechnical investigation was performed for the new Family Housing Upgrade at Fort Wainwright, Alaska.

The purpose of the exploration was to identify the subsurface and site conditions to assess geotechnical concerns. This report presents a summary of the findings based on results of laboratory tests, filed explorations, and general knowledge of the site.

2. Project Description and Location

It is our understanding the proposed project consist of removing the existing housing and replacing with new housing. Typical landscaping, pavements, and utilities are anticipated.

The site is located on Fort Wainwright, Alaska, near the Chena River. It is generally bounded to the north by 101st Airborne Drive, to the east by 102nd and 103rd Streets, and to the west by 100th Street. See enclosed Project Location and Vicinity Map (Figure 1).

Field Exploration

The subsurface exploration was conducted from January 19 to 31, 2001. Thirty test borings were drilled at the site consisting of twenty-three 7.6-meter (m) borings and seven 15.2-m borings.

The test borings were drilled with a tracked Acker Soilmax drill rig fitted with a continuous flight, 203-millimeter (mm) diameter, hollow stem auger. Corps of Engineers, Alaska District drill crew performed the drilling. geotechnical engineer with the Corps of Engineers supervised the drilling and logged the test borings in accordance with in accordance with ASTM D-2488, "Description and Identification of Soils (Visual - Manual Procedure)." A Corps chemist scanned the recovered samples for volatile organic compounds with a photo ionization detector (PID). PID readings are recorded on the exploration logs.

The test borings were originally sited in a rough uniform rectangular pattern over the site, but were re-sited at the request of the design build Architectural/ Engineering firm (A/E). The A/E focused the field exploration to particular areas of interest. Surveyed boring locations are shown on the enclosed Test Boring Location Map (Figure 2).

Soil samples were procured at frequent intervals in the test borings, generally 1.5-m. Drive samples were taken with a 64-mm I.D., split spoon sampler driven with a 136-kilogram (kg) hammer falling 0.74-m. The sampler was driven 0.60-m ahead of the auger. The number of blows required to drive each 0.15-m is recorded on the exploration logs. The blow count is an indication of the relative density or consistency of the soil. Grab samples were procured near the surface in the test borings.

4. Laboratory Testing

A laboratory-testing program was established to determine the physical properties of the soils encountered. The test methods implemented for this program are listed below.

- ASTM D 422-63 (Re-approved 1990), "Standard Test Method for Particle Size Analysis of Soils".
- ASTM D 2216-92, "Laboratory Determination of Water (Moisture) Content of Soil and Rock".
- ASTM D 2487-93, "Classification of Soils for Engineering Purposes (Uniform Soil Classification System)".
- ASTM D 4318-93, "Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils".
- TM 5-822-5/AFM 88-7 Chapter 1, "Pavement Design for Roads Streets, Walks, and Open Storage Areas", for determination of the frost classification of the soil.

Laboratory testing was also performed on soils within the project area to determine corrosivity characteristics. The test methods used for this analysis are listed below.

- SW 9045B pH in Waste
- SW 9050 Specific Conductance
- EPA 376.1 Total Sulfides
- EPA 300.0 M Anions by IC

The soil descriptions and classifications contained in this report and presented on the final test boring logs are the project engineer's interpretation of the field logs and results of the laboratory testing programs. The stratification lines represent approximate boundaries between soil types; the transitions are often gradual or not discernible by drill action. The final test boring logs are enclosed in Appendix A, the grain size distribution curves are enclosed in Appendix B, and the corrosivity testing results are enclosed in Appendix C of this report.

5. Regional Geology

Ft. Wainwright is located approximately 4 kilometers (km) southeast of Fairbanks in the broad, level flood plain of the Tanana and Chena Rivers. The flood plain consists of deposits of sand and gravel to depths of a hundred meters and more overlying bedrock. Overlying these deposits is a layer of windblown silt and/or sandy silt from 1-m to 6-m in thickness.

Groundwater is generally encountered a few meters below the ground surface within the flood plain area. Discontinuous permafrost is present throughout the region.

Ft. Wainwright is located in seismic probability zone 3, which has been assigned a seismic coefficient "Z" value of 0.3 according to Department of the Army TM 5-809-10 (October 1992), "Seismic Design for Buildings." Zone 3 is considered a major damage zone.

6. Site Conditions

Current Land Use:

The site is currently used for military housing with paved roads, parking aprons, underground and overhead utilities, playgrounds, and other related improvements. Overhead and underground utilities consisting of power, water, sewer, and steam were observed on the site. Other utilities may also be present. Utility depths were not investigated as part of this project.

Surface:

At the time of the investigation the site was generally covered with 0.3-m to 0.5-m of snow however, snow depths up to 1.2-m were found in several ground depressions where the snow had drifted. Topographically the site is planar with little relief. Site vegetation consists of grass, weeds, and trees.

Subsurface:

As expected from previous land use activities, the test borings indicate the surficial soils are made up of fill material. These soils are fine-grained and range in depths between 0.61-m to 4.72-m. These soils are predominately frost susceptible, with a frost classification of F4, and typically classifies as silt (ML) or silty sand (SM). Organics and debris including wood (Photo 1), glass, and metal fragments were encountered in this surficial layer. The depths in which organics and debris were encountered is shown in Table 1.

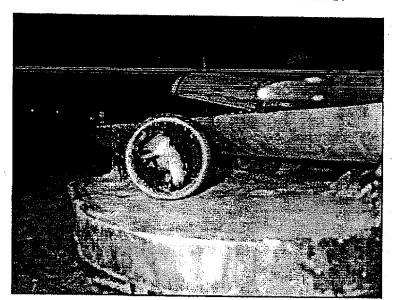


Photo 1: Wood debris encountered in the sampler shoe at a depth of 3.3-m in test boring AP-7938

The fill is underlain by brown to gray, frozen to wet, poor to well-graded sand (SP, SW) and poor to well-graded gravel (GP, GW) with localized zones of silty sand and gravel (SP-SM, SW-SM, GP-GM, GW-GM). Blow counts above the groundwater table indicate this material is relatively loose to medium dense.

The blow count and subsurface soil characteristics encountered for this project are consistent with the findings of other investigations in the area and also with the findings of a geologic evaluation performed in 1996 by Geomatrix Consultants. In this report, such soils were identified as being susceptible to liquefaction during seismic events. These soil conditions are also identified as being prone to liquefaction based upon criteria provided by Department of Army Technical Manual 5-818-1.

Organi	c and Det	Table 1 oris Materi	als Encountered
Test	Sample	Depth	Material
Boring	No.	(m)	
AP-7930	2	1.7	Wood, metal
	3	3.2	Roots
AP-7931	1	Surface	Metal
	2	1.7	Metal, glass
	3	3.2	Wood, organics
AP-7932	2	1.7	Wood
	3	3.2	Wood
	4	4.7	Wood, metal
AP-7935	4 3	4.7	Organics
AP-7938		3.3	Wood

The groundwater table was encountered in all test borings. The groundwater table levels encountered "while drilling" were recorded in all but 6 test borings. These 6 test borings were converted into temporary piezometers so that accurate and equilibrated ("after drilling") groundwater measurements could be obtained for the site. The results of the groundwater levels in these piezometers are shown in Table 2. As Table 2 indicates, the groundwater table elevations ranged between 132.69 and 133.05 on the site. The temporary piezometers consisted of 19-mm I.D. PVC pipe with handsaw cut slots. The piezometers were removed upon completion of the exploration. Groundwater levels can fluctuate seasonally with changes in precipitation, snowmelt, and runoff conditions. The depths at which the groundwater table was observed during and after drilling are presented on the exploration logs.

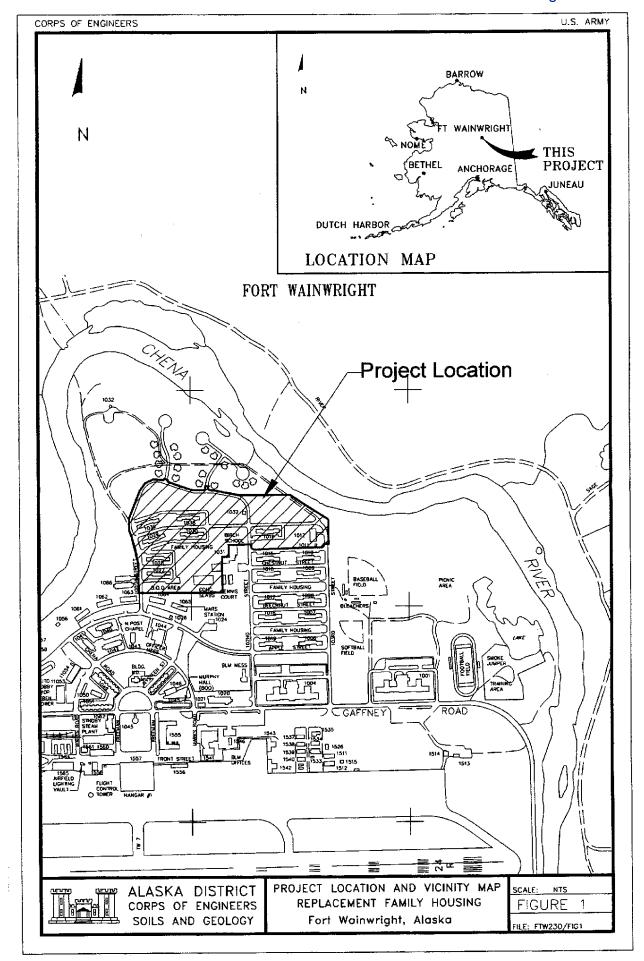
Tabl Piezometer Grou Eleva	ındwater Table
Test Boring	Elevation (m)
AP-7916	132.69
AP-7919	132.77
AP-7925	132,79
AP-7932	133.05
AP-7938	132.84
AP-7942	132,76

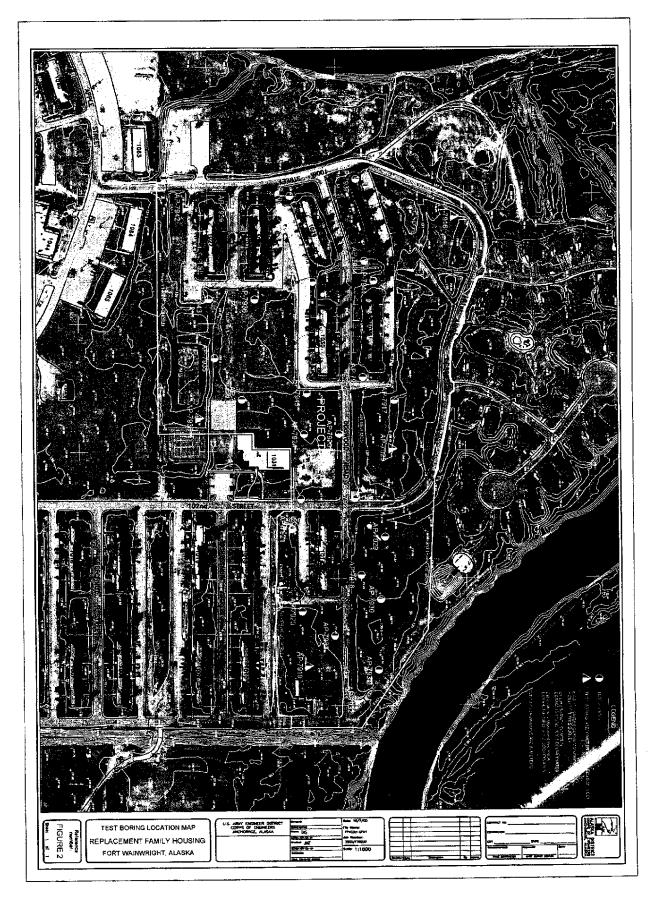
APPENDIX 4 Page 5

Seasonal, non-visible poorly bonded (Nf) to well bonded (Nbn) frozen soil was encountered in all the test borings. It was observed at depths ranging between 0.3-m to 0.5-m. However, under conditions of shallow or no snow cover (paved traffic areas), seasonal frost can penetrate to in excess of 2.4-m at the site during a cold winter.

Enclosures

- 1. Figure 1 Project Location and Vicinity Map
- 2. Figure 2 Test Boring Location Map
- 3. Appendix A Exploration Logs, AP-7916 to AP-7945
- 4. Appendix B Laboratory Results of Selected Soil Samples
- 5. Appendix C Corrosivity Results of Selected Soil Samples





APPENDIX A

EXPLORATION LOGS

AP-7916 TO AP-7945

ALASKA DISTR	101 1 7	.Y HOUSING UP Vainwright, Alas		Y230	Page 1 of 1 Date: 19 Jan 2001
Soils and Geology Sect	ICES Delling Academic	220 Alask	a District	Eleva	tion Datum:
EXPLORATION LO	IG Location: North	rthing: 1,209,24 sting: 423,77		<u> </u>	f Hole
Hole Number, Field: Permanent: AP-1 AP-7916	Driller: Bill Tester			Inspector: Mike Anderson	
Type of Hole: other Test Pit XI Auger Hole Maniforing W		to Groundwater		Depth Drilled: 7.5 m	Total Depth:
Hammer Weight: Split Spoon I.D: Size	and Type of Bit: 2 mm Rock Bit	Type of Equip		1	ol Samples: Lb and Drive
	11000	Grain Size		Descri	iption and Remarks
Depth (m) Lithology Sample Frozen ASTM D 4083 TM 5-822-5 Blow Count Symbol	2487 or D 2488	%Fines Size (mm)	PID (ppm) % Water	Parameter of the second	
Nf Grab ML SILT w	ith Sand	19.		Brown, frozen to r (NP) fines, trace o	noist, fine sand, nonplastic rganics, fill
[_ , <mark> - </mark>					
F2 4 SM Silty S	AND 3	76 21 19	.1 0.3 30	Dark brown, mois coat present in sa	t, fine to coarse sand, NP, filt, imple
3 SP- Poorly 3 SM	graded SAND with Silt		0.3	Dark brown, mois fines, possibly fill	rt, fine to medium sand, NP
F2 1 SM Silty S	AND 2	72 26 19	0.4 27	organics by volus	wet, fine sand, NP fines, 10% me, organic odor, first 150 anced under weight of
- 6 GW Well-g	raded GRAVEL with Sand	50	0.4	0.3 m of heaving Olive brown, wet, gravel, fine to co:	subangular to subrounded
10 GW Well-g	raded GRAVEL with Sand	50	0.3	0.8 m of heaving Olive brown, wet, gravel, fine to co-	, subangular to subrounded arse sand
9				Elevation 128. Groundwater End depth 3.75 m	
NPA Form 19-E May 94 Prev. Ed. Obsolete	Proje	ject: FAMILY HOUSIN	IG UPGRADE	- FTW230	Hole Number: AP-7916

				CORPS	S OF E	DISTRICT ENGINEERS G SERVICES	Project:	FAMIL Fort W					- FTI	V230	<u> </u>	age 1 of 1 late: 19 Jan 2001
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E	EXI	PL	OR	ATI	10	LOG	Location:		lhing: ting:		9,181 3,951				Top of H Elevation	
Hole Nu AP-2	ımber,	Field		Permar AP-7.			Driller: Bill Te:	ster						Inspector: Mike Ar	nderson	
Type of Tes				lole [3 Mon	itoring Well Pi	_ ezomeler	Depth t		undv 1.93 m				Depth Dril 7.5 m	led:	Total Depth: 8.1 m
Hamme 136 k		ght:		l Spoon I 3.5 mm	I.D:	Size and Type of 203.2 mm Rock					quipn Soil M				Type of S Grab a	amples: nd Drive
£ ,		4083	ass. 22-5	TU X		Classification ASTM: D 2487 or D 24	188		rain S	T	(mm)	Ē			Descriptio	n and Remarks
Depth (m) Lithology	Sample	Frozen ASTM D 4083	Frost Class TM 5-822-	Blow Count	Symbol			%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water			14. 14.
_ 1	1	Nf	F4	Grab	ML	Sandy SILT	· -	7	39	54	19.1	0.4	14	Brown, fro trace orga		nd, nonplastic (NP) fin
- 2	2			3 4 3	SP	Poorly graded SANI	•					0.4		Brown, m	oist, subtou	nded gravel, line sand
- 3		-	NFS	9 15 19	SP	Poorly graded SANE) with Grave	47	48	5	44.5	0,4	2		oist, subang e and coarso	ular to subrounded e sand
5				8 15 14 15	GW	Well-graded GRAVE	L with Sand				50.8	0.4		Brownish to coarse		, subrounded gravel, fi
6	**************************************			7 8 8 11	GW	Well-graded GRAVE	L with Sand				50.8	0.4		Olive gray	heaving sau wet, suban to coarse s	gular to subrounded
8	6			12 11 11 6	GW	Well-graded GRAVE	L with Sand				\$7,2	0.4		Olive gray,	to coarse s	gular to subrounded
9											-			Groundwat depth 3.93	n 128.8 m Ier Encounti m	ered While Drilling: at ation Detector
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Hole Number, Field:	<u></u> 1	Permane AP-79			Driller: Bill Teste	r				. <u></u>		Inspector: Mike Ar	derson		
Type of Hole:	other uger Ho	ole 🗀	Monit	oring Well Pi	ezomeler	epth to		indwa S3 <i>m</i>				Depth Drill 15.2 m	ed:		Total Depth: 15.8 m
Hammer Weight:	Split	Spoon 1. 1.5 mm		Size and Type of 203.2 mm Rock	of Bit:	1	• •		uipme oil Ma				Type o Gra	Sam	
Depth (m) Lithology Sample Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 2	488	%Gravel	%Sand	%Fines &	Мах Size (тт)	PID (ppm)	% Water		Descri	ption a	nd Remarks
Lithe Barn Froi	Fro	Grab	Wr	Sandy SILT		3%	3%	3%	E 19.1	1.4	%	Brown, he fine sand organics,	, nonplas	noist, s tic (NP	ubrounded gravel,) fines, trace
- 1		5434	SP	Poorly graded SAN	on On				-	0.4		Brown, n		to me	dium sand, NP lines,
		•													
3		3 14 14 16	SP	Poorly graded SAN	ID with Gravel				50.8	0.2		gravel, fi			ar to subrounded and
- 5		11 14 12 11	GW	Well-graded GRAV	FEL with Sand				50.8	0.2		Brown, w fine to co driving	ret, subai parse san	ngular id, son	to subrounded gravel, ne fractured gravel by
- 6		4 8 3 4	GW	Well-graded GRA\	/EL with Sand				44.5	0.2		Olive gra gravel, fi (wood)	iy, wel, si ne lo coa	ubangi irse sa	ular to subrounded nd, trace organics
6	PFS	20 14 9 6	GP	Poorty graded GR Sand	AVEL with	53	43	4	75.2	0.4		1.2 m of Olive gra gravel, fi	ıy, wet, s	ubang	ular to subrounded and
7		10 12 7 6	GW	Well-graded GRA	VEL with Sand				44.5	0.5	tabalan mark	0.3 m of Olive gra coarse s	ov wets	ubrou	nded gravel, fine to eaving sand
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11	8			13 15 17 18	GW	Well-graded GRAVE	L with Sand				57.2	0.2		0.3 m of h Olive gray gravel, fin gravel	. wet. suba	d Ingular to si	ubrounded e fractured
12	9			6 7 11 9	sw	Well-graded SAND w	rith Gravel				25.4	0.2		Olive gray, gravel, find		ngular to so	ubrounded
5						,					and the second s						
	10			10 14 20	SW	Well-graded SAND w	ith Gravel				38.1	0.3	ļ	0.6 m of he	•		.
6				31			···							Olive gray, gravel, fine Bottom of I Elevation Groundwal depth 4.63 PID = (Hot)	to coarse tole 15.8 m i 121.7 m er Encount m	sand I Iered While	Drilling: a
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	- 2 - 3				NFS	3 2 3 5	SP- SM	Poorly graded SAN	D with Silt	13	80	7	25.4	0.3	4	Brown, m	oist, fine :	and	-, - -
	- 4 - 5	_111	4			6998	SP	Poorly graded SAN	D				38.1	0.4		Orown, m	oist to we	t, fin	e to medium sand
	- 6	.0.	5.			3 11 22 8	SP	Poorly graded SAN	O with Grave)			38.1	0.3			et, subang arse sand		to subrounded gravel,
SEO LOG GDT 3/12/01	- 7 - 8					5 17 16 12	GW	Well-graded GRAV	EL with Sand				44.5	0.3		Olive gray	neaving sa y, wet, sub ne to coars	angı	ular to subrounded nd
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			8 7 8	GW	Well-graded GRAVE	L with Sand	j	:			50.8	0.2		1.1 m of he	_	gular to subrounded
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	F	, Fif				DISTRICT NGINEERS	1 ,	FAMILY Fort Wa					- FT	V230		age 1 of 1
		a o o	<u> </u>	ENGINE	ERIN	SERVICES	Drilling Age				iaska			· · · · · · · · · · · · · · · · · · ·	Elevation	ete: 22 Jan 2001 Datum:
1						Section	C Other	-							OSO MSL	. 🔲 other
E	XF	PL(OR	ATI	ON	LOG	Location:	North Easti	_	-	9,089 4,157				Top of Ho Elevation	
Hole Num	ber,	Field:		Perman AP-7			Driller: Bill Teste	er						Inspector: Steve H	enslee	
Type of H			other uger l	Jole [1 Moni	toring Well	Diezometer	epth to		ยกต่น .18 m				Depth Drill	ed:	Total Depth:
Hammer \	Weig		Spli	t Spoon I		Size and Type	of Bit:		Туре	olE	quipm Soil M				Type of Sa	<u> </u>
136 Kg		8	 	5.5 mm	T	Classification	- DIL	G ₄	rain S		Y	ax	Ι	<u>}</u>		and Remarks
Depth (m) Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	ASTM: D 2487 or D 2	488	%Gravei	%Sand	%Fines	Max Size (mm	PID (ppm)	% Water		Description	Tana Ivania ka
		Nbn		Grab	SM	Silty SAND		•				0.8			zen to moist , possibly fill	t, fine sand, nonplastic
- 2	2		F4	2 2 3 3 3	ML	SILT with Sand		6	14	80	38.1	0.4	26	Brown, m	oist, line san	d, NP, possibly fill
3,00	3		PFS	15 23 21 19	GW- GM	Well-graded GRAY and Sand	EL with Silt	53	40	7	50.8	0.4	2	Brown, m	oist, rounded	d gravel, fine and coarse
- 5	. ♣ . ♣			10 10 8 10	SP	Poorly graded SAN	iD					0.5		Brown, m	oist, medium	sand
6 7	5		PFS	6 7 6 7	GW	Well-graded GRAV	EL with Sand	55	41	4	50.8	9.3		Gray, wet,	, subrounded	d gravel, fine to coarse –
- 8	6			15 20 25 25	GР	Poorly graded GR/ Sand	AVEL with				19.1	0.3		Gray, wet,	eaving sand , subrounded Hole 8.1 m	d gravel, fine to coarse
- 9												1		Elevation Groundwa depth 5.18	on 129,9 m ster Encount 3 m	ered While Drilling: at cation Detector
NPA Form								Projec		<u> </u>				E734/230	· · · · · · · · · · · · · · · · · · ·	Hole Number:

		S 2		*	E	CORP ENGINE	S OF EERIN	DISTRICT ENGINEERS IG SERVICES	Project: Drilling Ag	Fort V		right	, Alas	GRAD ka Distr		W230	Fleva	Page Date: ion Dat	1 of 1 22 Jan	200
								Section	Oth	er							D80 N	ISL	othe	r
	L	:X	PL		ル ー	ΑI		1 LOG	Location:		thing ting:		09,080 24,070				Top of Elevat		137.8 m	
Hole AP		mbei	r, Fiel	d: 		Perma AP-7			Driller: Bill Tes	ster						Inspector: Steve H	lenslee			
	e of Test		: (C) (X)		-	lole [☐ Mor	itoring Well Pi	_ ezometer	Depth			water: n WD			Depth Drill 7.5 m	led:	То	tal Depth 8.1 m	ıî
	nmer 36 kg	Wei	ght:		-	Spoon 3.5 mm	I.D:	Size and Type of 203.2 mm Rock					quipi Soil A		· · · · · · · · · · · · · · · ·		Type of Grab	Sample and Dr		
_	_		1007	3	22.5	į		Classification ASTM: D 2487 or D 24	18B	(rain S	ize	(me)	-		<u> </u>	Descrip	tion and	Remarks	
Depth (m)	Lithology	Sample	Frozen ACTAL DA083	E Control	TM 5-82	Blow Count	Symbol			%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water				-	
	\bigotimes	1	Nb	1		Grab	ML	SILT	· · · · · · · · · · · · · · · · · · ·				-	0.4		Brown, fro (NP) fines,	zen to mo , possibly	ist, fine fill	sand, non	pla
1	***																			- :
60000	※				F4	2	ML	SILT with Sand			23	77		0.3	21	Brown, mo	oist, fine s	and, NP	fines, pos	sibi
20	$\overset{**}{\otimes}$	2				2 3 5 4							4			,	•	,		
200	₩							·	- ,				İ						: :	
3			Į	PI	FS	15	GP-	Poorly graded GRAV	EL with Sill	44	45	6	38.1	0.4	2	Tan, moist	, subroun	ded grav	rel, fine an	ıd
Ē		3				18 20 25	GM	and Sand								coarse san	id	•	:	
4	Ÿ								-				!							
	o i					6	\$W	Well-graded SAND w	ith Gravel				25.4	0.4		Gray, mois	t to wet (t	ottom 2	03 mm of s	sam
5	9	•				9				1						subrounde fines	d gravel, l	line to ci	oarse sand	5, N
	♦~																			
6						7	SP	Poorly graded SAND	with Gravel				38.1	0.4		0.6 m of he	aving san	d		
	٥	5				4										Gray, wet, s coarse sand		ed grave	ł, medium	to
7											ĺ				1					
		6				7 5 5	SP	Poorty graded SAND					12.7	0.4		1.2 m of hea	ıving sanı	d		
8					-	-	_						_	_		Gray, wet, s	1	d grave	l, medium	to
9																Bottom of H Elevation Groundwate depth 4.95 n PID = (Hot) F	129.8 m er Encoun n		•	g: a
0	0777	19-E								Omic.								- I ·		<u></u>
			d. Ob	sole	te			<u> </u>		Project FAI		ious	ING U	PGRA	DE • F	TW230			e Numbei 1 <i>P-</i> 7921	Γ.

<u> </u>		<u> </u>		1			DISTRICT	1 1	AMIL)					- FTY	V230	<u> </u>	Page 1 of 1
	Sc	画 Slic	<u>ሙ</u> an	<u> </u>	NGINE	ERIN(NGINEERS SERVICES Section	Drilling Age	ncy:				Distric	:t			Date: 22 Jan 2001 on Datum: SL 🔲 other
							LOG	Location:		-		9,089 4,047			<u> </u>	Top of I	Hole
Hole		iber,	Field:		Perman AP-79			Driller Bill Teste	er .						Inspector: Steve H	enslee	
1 "	e of F Test		□ D&1 A		lole [] Mon	iloring Well	ezometer D	epth to		undw .09 m				Depth Drill 7.5 m	ed:	Total Depth: 8.1 m
1	nmer 136 kg	-			Spoon 1. 3.5 mm	.D:	Size and Type of 203.2 mm Rock			A	cker S	quipm Soil M		T			Samples: and Drive
Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 24	488	%Gravel	ain Si	%Fines	Мах Size (mm)	PID (ppm)	% Water		Descripti	ion and Remarks
-			Nbn		Grab	SM	Silty SAND with Gr	avel .				6.4	1.0		Brown, fro fine and co POSSIBLE	oarse sand	ist, subrounded gravel, d, nonplastic (NP) fines,
- 2		2 2a	: :	F4	9 7 6	ML SP	Sandy SILT Poorly graded SAN	D		42	58		0.4	15	Brown, mo		and, NP fines, possibly fill
- 3		3		NFS	20 27 34 39	GP- GM	Poorly graded GRA and Sand	VEL with Silt	53	41	6	38.1	0.4	2	Tan, moisi coarse sai		ded gravel, fine and
_ 5		# **:	-		4 2 3 4	SP	Poorty graded SAN	D .				0.0	0.5	-	Gray, moi:	st, mediun	n sand
6		5			2 2 3 5	SP	Poorly graded SAN	D				25.4	0.4		1.2 m of h	-	nd led gravel, medium sand
7	D	6			6 8 10	SW	Well-graded SAND	with Gravel				12.7	0.4			*	nd led gravel, fine to coarse
9 10 NPA	4-23.1						. :								Groundwa depth 5.09	n 130.0 m ster Encou Im	
– 10 NPA May	Form 94 P			solele					Project FA		нои	SING	UPGR	ADE -	FTW230		Hole Number:

0000	<u> </u>	0 0 0		CORP	S OF	DISTRICT ENGINEERS IG SERVICES	Project:	FAMIL Fort V					E - FT	W230	, r	Page 1 of 1 Date: 22 Jan 2001
Soi	ls a	an				Section	Orilling A			D X J /	Alaska	a Disti	rict		Elevation	on Oalum:
						LOG	Location	No	thing		09,12 23,98				Top of I	Hole
ole Numb	er, Fi	eld:		Perma		······································	Driller:		miy.		23,30	+ 111		Inspector:	Elevation	on: 137.9 m
ype of Hol	le: [other	AP-7	923		Bill Te	Depth:	- C-					Steve H		
Test Pit	08	J A	uger l			iltoring Well 🔲 Pid	ezometer	Берш		5.03 n				Depth Drille 7.5 m	20:	Total Depth: 8.1 m
mmer Wi 136 kg	eight:			t Spoon 53.5 mm	1.D:	Size and Type of 203.2 mm Rock					quipr Soil A				Type of S Grab	Samples: and Drive
Lithology	ozen	ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 24	188	%Gravel	Sand Sand	Ī	Max Size (mm)	PID (ppm)	% Water			on and Remarks
	i ii N	lbn	ĒΨ	Grab	ML	SILT with Sand		0%	8%	3%	50.8		7%	Brown, Iroz nonplastic	ten to mai (NP) fines	st, fine to coarse sand, , possibly fill
2			F2	5 4 3 3	SM	Silty SAND with Gra	vel	20	32	48	38.1	0.5	9	Brown, moi	st, fine sa	nd, NP fines, possibly (
			PFS	8 11 10 9	GW- GM	Well-graded GRAVEL and Sand	, with Sin	55	37	8	50.8	0.6	2	Brown, moi coarse sand		nded gravel, fine and
				9 14 21 25	SP	Poorly graded SAND	·				38.1	0.6	-	Brown, mois coarse sand		nded gravel, medium to
55				13 18 17 21	GP	Poorly graded GRAVI Sand	EL with	*			6.4	0.3		Gray, wet, so	prounded	l gravel, fine to coarse
6				22 25 32 23	GP	Poorly graded GRAVE	EL with				5.4	0.3		Gray, wet, su sand, NP fine	brounded s	gravel, fine to coarse
							·				1			depth 5.03 m	129.8 m Encounte	red While Drilling: at
Form 19-1	E]	Project		-						Hole Number:

		C	ORPS C	OF EN	STRICT GINEERS SERVICES	Project: FAMILY HOUSING UPGRADE - FTW230 Fort Walnwright, Alaska Drilling Agency: DXI Alaska District									ge 1 of 2 ate: 23 Jan 2001 Datum:
Soils	ano				Section	Drilling Agency	y :	Œ	I Alas	ka Dis	strict			DEC MISL	other
EXP	LC)R/	ATIC	ĴΝ	LOG	Landing.	Northi Eastir	-		093 m 984 m				Top of Ho Elevation	1
ole Number, F			Permane	nt:		Driller:							Inspector: Steve H	enslee	
AP-9 ype of Hole:	<u> </u>	ther	AP-792	4			oth to	Grou	indwa	ter:		+	Depth Drill	ed:	Total Depth:
		iger H	ole 🗆	Monito	oring Well 🔲 F		— <u> </u>		33 m l				12.2 m	Type of S	12.2 m amples:
ammer Weigh 136 kg	t		Spoon I.I 3.5 mm) :	Size and Type 203,2 mm Roci	k Bit Acker Soil Max						Grab a	nd Drive		
	083	نەن	E		Classification ASTM: D 2487 or D	2488	 -	ain Si		Max Size (mm)	(mc	*		Descriptio	on and Remarks
Deptin (m) Lithology Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol			%Gravel	%Sand	%Fines	Max Siz	PID (ppm)	% Water			
₹ 5 8 <u>1</u>	AS AS	TT	ਲੋਂ Grab	が ML	SILT	<u></u>	6	8~		-	0.3		Brown, fr to medius possibly	m sand, nor	st, subangular gravel, fine nplastic (NP) fines,
1 2.			9 10 9 9	SM	Siity SAND						0.3	-	Brown, n	noist, fine sa	and, NP fines, possibly fill
3		F4	3332	ML	Sandy SILT		5	27	68	19.1	0.4	19	Brown, 1	moist, fine s	and, NP fines, possibly fill
4 0 0 0			9 7 10 8	SP	Poorly graded S	AND with Gravel				19.1	0.3		Gray, m NP line:		brounded gravel, fine sand
0													Ţ.	٠	
- 6			7 3 3	GP	Poorly graded (Sand	GRAVEL with				19.1	0.3		Brown, sand	wet, subrou	inded gravel, fine to coars
- 76 G										25.4	0.4		Grav. v	vet, fine sub	rounded gravel, fine to
- 8 3 9 6 - 8 3 9 7 7 - 10 NPA Form 1			6796	sw	Well-graded SA	ND with Gravel				43.4	y.•		coarse	sand	e a la companya de l La companya de la co
- 9	Technology.		6 11 19 29										Spoor	damaged d e recovery.	iuring advancement, no
NPA Form 1 May 94 Prev	9-E	<u> </u>	ala.				Pro	ject FAM	LY HO	USIN	UPG	RAC	DE - FTW230	0	Hole Number: AP-7924

Soils and Geology Section EXPLORATION LOG Other Delta Delta Other Delta Delta Other Delta Delta Delta Delta Delta Delta Delta	ALASKA DISTRICT CORPS OF ENGINEERS	Project:				G UPGI Alaska		FTW230		Page 2 of 2
EXPLORATION LOG	Soils and Geology Section	1	gency:						Elevatio	n Datum:
Hole Number, Field: AR-1924 Driller: Bill Tester Silve Massies Type of Hole: Other Silve Monitoring Well Piezometer Silve Monitoring			. No						Top of H	ole
Type of Hole: □ other □ rest Pit		i	-						<u>.l.,</u>	1. 190,2 //
Hammer Weight: Spill Spoon D. Size and Type of Bit 200.2 mm Rock Bit 200.2		iezometer	Depth					Depth Drill		L '
Classification of Part of District Classification of District Classi			<u> </u>							amples:
Spoon damaged during advancement, sample not recovered, drilled to 12.2 m for next sample, unable to overcome heave 12	## Count (m) Count	488	<u> </u>							
Spoon damaged during advancement, sample not recovered, drilled to 12.2 m for next sample, mable to vercome heave Bottom of Hole 12.2 m	D D 0 EX EF B 0		- %	8	3%	Ma	ă	ŝ	-	
Elevation 126.0 m Groundwate Encountered While Drilling: at depth 5.33 m PID = (Hot) Photo Ionization Detector 15 16 17 18								not recove	red, drilled t	o 12.2 m for next
Project: Hole Number:	14 15 15 16 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18		Project:					Elevation Groundwald depth 5.33	1 126.0 m er Encounte m Photo Ioniza	ation Detector

	9		<u>.</u> =					DISTRICT ENGINEERS	Project:					G UPO Alask		E • FT	W230		******	e 1 of 1
	<u>_</u> _	S(eres		ENGINE	ERIN	Section	Orilling Ag	ency:				laska		ct		1		Dalum:
								\ LOG	Location:	No	orthir	-		9,177 3,998				Top of Elevati	Hole	other e 137.0 m
		Nui -10	mber	, Field	:	Permar AP-7			Oriller: Bill Tes					-,		· <u>-</u> ,	Inspector. Steve H	.1		
		e of I		120 A	other luger] Мог	itoring Well	ezometer	Depth	to C		ındv 17 m		-		Depth Drill 7.5 m	ed:		Total Depth: 8.1 m
		mer 36 kg	Wei	ght:		lit Spoon 63.5 mm	I.D:	Size and Type of 203.2 mm Rock			Ту			quipm Soil M				Type of Grab		ples. Drive
	(m)	λîς	<u>a</u>	Frozen ASTM D 4083	st Class. 5-822-5	Blow Count	5	Classification ASTM: D 2487 or D 24	188	-	Grain	Ť		Max Size (mm)	(mdc	er.		Descrip	tion a	and Remarks
	Depth (m)	X Lithology	1	Froze		Mo Grab	Symbol	SILT with Sand		6/15/2/3/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/		%Sand	%Fines	Max S	PID (ppm)	% Water				
	-	**	1	MDR	:	Oran	ML	SICI WITH SAID				ŀ					(NP) fines,			ine sand, nonplastic
	1	※															1			
	-	***	2		F4	3 3 4	ML	Sandy SILT			. 3	13	67			24	Вгомп, то	oist, fine s	and,	RP fines, possibly fill
	- 2	※				,														
	- 3				NFS	6 10	GP	Poorly graded GRA\ Sand	/EL with	54	4	8	2	25.4		2	Brown, mo		unde	ed gravel, fine and
						7 9		75.10									CO413E 381	I.G		
	- 4				}			-									2			
	~ 5		4			10 12 13 15	GP	Poorly graded GRAV Sand	/EL with				•	6.4			Brown, we	t, subroui	nded	gravel, fine to coarse
ŀ)					·.												
	- 6		5			13 10	GW	Well-graded GRAYE	L with Sand					31.8			Brown, wel	l, subrour	nded	gravel, fine to coarse
						9			•											
3/12/01	- 7						GP	Ready and d CRAY	en u								. ,			
0G GDT	- 8		5			10 12 8 11	GP	Poorly graded GRAV Sand	EL with					19.1	{		sand			avel, fine to coarse
EXPLORATION LOG FTW230 GPJ GEO LOG GDT 3/12/01	- 9		·		·			1										n 128.9 m er Encoul	ı	d After Drilling: at
G FTWZ	3							t												
ATIONIC	-10													_						
EXPLOR	NPA I May 9			E d. Ob	solete)				Proje		ΥH	ous	ING U	PGRA	DE	FTW230			Hole Number: AP-7925

	0.00	CORP	'S OF	DISTRICT ENGINEERS	Project:				NG UF		E - F7	W230	. —	age 1 of 1
Soils a				NG SERVICES Section	Drilling A	· · · · · · · · · · · · · · · · · · ·	·		Alask	·	rict		Elevation	ate: 24 Jan 2001
				N LOG	□ Ot		1. 1					<u>-</u>	DEC MS	L other
				N LUG	Location		ortnii astini		209,15 423,92				Top of H	
Hole Number, Field AP-11	d:	Perma AP 7			Driller: Bill Te	ester						Inspector: Steve He	ensiee	
Type of Hole:	other Auger H	lole [☐ Mo	nitoring Well 🔲 Pie	ezometer	Depth	to G		water m WD		·····	Depth Drille		Total Depth:
Hammer Weight: 136 kg		Spoon 3.5 mm	I.D:	Size and Type o	l Bit:	L	Ту		Equipr			L	Type of Sa Grab an	Imples:
6083	lass. 22-5	č		Classification ASTM: D 2487 or D 24	RO		Grain	Size		T	Τ	T		and Remarks
Depth (m) Lithology Sample Frozen ASTM D 4083	Frost Cla TM 5-822	Blow Count	Symbol	75 till. D 2407 (c g) 24	00	%Gravet	200	%Fines	Max Size (mm)	PID (ppm)	% Water			
1 Nbr		Grab	SM	Silty SAND		-	3		-	0.6	%	Brown, froz (NP) fines, (en to moist possibly fill	, fine sand, nonplastic
											i			
	F4	2 3 4	ML	Sandy SILT			3;	67		0.9	15	Brown, moi	st, fine sand	l, NP fines, possibly fill
- 2		3												± 4.
												··· • • • • • • • • • • • • • • • • • •		
- 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	NFS	8 9 12 11	GP- GM	Poorly graded GRAVI and Sand	EL with Silt	61	34	5	50.8	0.9	1	Brown, mois coarse sand	t, subround	led gravel, line and
		11												1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
- 4		7	GP			-								
		14 18 17	GP	Poorty graded GRAVE Sand	EL with				19.1	1.1		Brown, mois coarse sand,	t, subround NP fines	ed gravel, line to
- 5											*			
- 6		9	GP	Poorly graded GRAVE	L with				38.1			Rrown wat a	uhroundad	gravel, medium to
5	ļ	9 11 10 8		Sand								coarse sand		graver, medium to
- 7														
	NFS	9	GP	Poorly graded GRAVEI	L with	63	33	4	50.8		7	0.3 m of heavi	ing sand	
8		5	_	Salid								Gray, wet, fine	subrounde	ed gravel, fine to
											ļ	Bottom of Hol Elevation 1	30.0 m	d While Drilling: at
9											- 1	depth 5.03 m PID = (Hot) Ph		
10										.				
PA Form 19-E lay 94 Prev. Ed. Obsc	olete					Project FAM		lousi	NG UP	GRAD	E-FT	W230	Ţ,	fole Number:
							<u> </u>			10	//		- 1	74T-146V

51. File			 簡	/ ii			DISTRICT	1				G UPG Alaski		· FT	W230	·	nge 1 of 1					
	d	<u> </u>	0000		ENGINE	ERIN	ENGINEERS G SERVICES	<u> </u>								<u>-</u>	ate: 24 Jan 2001					
							Section	Drilling Agen				laska		ct	*****	Elevation (XI MSL	. 🔲 other					
	E	XI		OR 	RATI	O N	LOG	Localion:	Nort East	_		9,033 3,949				Top of Ho Elevation						
Hole I AP-1		nber,	, Field:		Perman AP-75			Driller: Bill Tester	•						Inspector: Steve H	lenslee						
Type				other	Hale (] Mon	itoring Well 🔲 Pi	De	epth to		undw i.33 m				Depth Drill 7.5 m	ed:	Total Depth: 8.1 m					
Hamm 138	ner 6 kg	-	ght:	1 '	il Spoon I 63,5 mm	.D:	Size and Type of					quipm Soil M		i		Type of Sa Grab an						
Ī			88	200	_		Classification		G	rain S	ize	Ê	<u> </u>			Description	and Remarks					
Classification of Depth (m) Sample ASTM D 4083 Frost Class. TM 5-822-5 Blow Count Symbol Symbol								100	%Grave!	%Sand	%Fines	Max Size (mm	PID (ppm)	% Water		·						
1 ××××××××××××××××××××××××××××××××××××		1	Nbn		Grab	SM	Sity SAND with Gra	avel		-		4	1.6	8		own, frozen to moist, subrounder e sand, nonplastic (NP) fines, po						
100000000000000000000000000000000000000		2		T 79 F Februaria Maile	4 4 5 5	ML	SILT with Sand						0.7		Brown, mo	oist, fine sam	t, NP fines, possibly					
3		3a 3b		F4	4 4 3 3	ML SP	Sandy SILT Poorly graded SAN	Ď		45	55		0.6	11	l .	oist, fine sand , medium sa	I, NP fines, possibly nd					
5		4		S2	1 3 4 6	SM	Silty SAND	-		74	26			33		own and darl aint sewage	r gray, wet, fine sand odor present					
μ	1					·		• • •						1	_							
6		5			1 1 1	SP	Poorly graded SANI)							Gray, wet,	fine sand						
7		6			1 3 41	SP	Poorly graded SANI	,							Dark gray,	wet, fine to n	nedium sand					
9		3.70			7										Groundwai depth 5.33	n 129.8 m ter Encounte m	red While Drilling: a					
0							51/444,484.4								·	7.2.00						
PA Fo				solete				J.P	tojeci FAA		HOUS	ING U	PGR4	IDE - 1	FTW230		Hole Number: AP-7927					

			CORP	SOF	DISTRICT ENGINEERS	'	FAMIL Fort V				GRADI ka	E • FT	W230	<u> </u>	age 1 of 1 ate: 25 Jan 2001
Soils	ar				g services Section	Drilling Age	-		080 /	Alaska	Distri	ict	<u> </u>	Elevation	Datum;
					l LOG	Location:		thing sting:		09,14; 24,04;		: .		Top of H	ole
Hole Number, AP-13	, Field		Perma AP-1			Driller: Bill Teste	er					- 1,,, - =	Inspector: Steve H	ensiee	
Type of Hole:		other luger l		☐ Mor	itoring Well 🔲 Pie	Depth to Groundwater: iezometer 5.03 m WD							Depth Drill	ed:	Total Depth: 8.1 m
Hammer Weig 136 kg	ght:	4 1	it Spoon 63.5 mm	I.D:	Size and Type of 203,2 mm Rock E					quipr Soil A				Type of Sa Grab ar	amples: ad Drive
Depth (m) Lithology Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	Classification ASTM: D 2487 or D 24	88	%Gravel	Grain S	Τ	Мах Size (mm)	PID (ppm)	% Water		Description	and Remarks
1	Nbn	<u>u -</u>	Grab	ML	SILT with Sand		8	38	%	2	1	*	Dark brow nonplastic	n, frozen to : (NP) fines,	moist, fine sand, possibly fill
2 2			5 5 4	SM	Silty SAND	·····	7				0.6	7.000	Вгомп, гно	oist, fine san	d, NP fines, possibly fil
3 0 3		\$2	2 3 12 14	SM	Silty SAND with Grav	rel	34	47	19	38.1	0.4	20	Brown, mo NP lines	ist, subroun	ded gravel, line sand,
5,0	ه هرين هېدندست		12 15 15 13	SP	Poorly graded SAND	with Gravel				44.5	0.2	_	Brown, mo sand	ist, subroun	ded gravel, medium
6 5		PFS	7 10 14 9	GW	Well-graded GRAVEL	with Sand	61	35	4	50.8	3.2	7	Brown, wet	, subrounde	d gravel, fina to coarso
7 8			9 14 17 18	GP	Poorly graded GRAVE Sand	EL with				57.2	2.8		sand		gravel, fine to coarse
9			T TO THE REAL PROPERTY OF THE PARTY OF THE P										depth 5.03 n	129.9 m er Encounter n	red While Drilling: at
10															
PA Form 19-E ay 94 Prev. Ed		olete				P	roject FAN		lous	ING U	PGRA	DE - F	TW230		Hole Number: AP-7928

Î			. Fi	a di			DISTRICT	Project:	FAMIL Fort				GRAD.	E - FT	W230		Pag	e 1 of 1
&					ENGIN	EERIN	IG SERVICES	Drilling A		2 01111			a Distr	ict		Elevat	Date ion D	
							Section	Oth	ner							080 M	ISL	Other
	t	.X	۲L	Uh	KAI	IUI	\ LOG	Location:		rthing sting:		09,17 24,08				Top of Elevati		137.7 m
Hole AP		mber	, Field	l: 	Perma AP-7			Driller: Bill Te:	ster						Inspector Steve	: Henslee		***************************************
• •	e of Test			other Auger		☐ Mor	iltoring Well	- ezometer	Depth			waler n WD	:		Depth Dri 7.5 m	lled:	1	Total Depth:
	imer 36 kç	Wei g	ght:	. i	it Spoon 63.5 mm	l.D;	Size and Type o 203.2 mm Rock I		•	1		quipi Soil I				Type of Grab		
Ê	>		4083	ass. 2.5	unt		Classification ASTM: D 2487 or D 24	88		Grain S	ize	(mm)	E			Descript	tion ar	nd Remarks
Depth (m)	Lithology	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	-	-	%Gravet	%Sand	%Fines	Max Size (mm)	PiO (ppm)	% Water				
	**	1	Nbi		Grab	ML	SILT						5.8		Dark brov nonplasti	wn, frozen ic (NP) fine	to mo s, pos	ist, fine sand, ssibly fill
- 1		2		F2	3333	SM	Silty SAND		2	57	41	19.1	3.2	11	Brown, m	ioist, line s	and, I	NP fines, possibly fi
3 4	***	3a _3b	-	NFS	4 7 10 10	ML SW- SM	SILT Well-graded SAND w Gravel	ith Silt and	29	61	10	38.1	3.8	4	odor, pos	sibly fill		NP fines, humus
- 5		4.			12 14 13 15	GP	Poorly graded GRAV Sand	EL with				44.5	6.4		Brown, mo coarse sa		undec	d gravel, fine to
6		5			11 13 12 7	GP	Poorly graded GRAVI Sand	EL with				38.1	0.6	-	Gray, wet, sand	subrounde	ed gra	ivel, fine to coarse
7 (6) (1)	D: (-)	6			17 14 15	sw	Well-graded SAND wi	th Gravel					0.6			wet, fine si	ubrou	inded gravel, fine to
9	Ö.				18							1,000			Coarse san Bottom of I Elevation	wet, subro id, humus i Hele 8.1 m in 129.7 m ter Encoun m	under odor tered	d gravel, fine to While Drilling: at
		19-E	d. Ob:	solele					Project FAA		ious	ING U	PGRA	DE - F	71 W2 30		H	ole Number:

編	Project:	FAMIL					E - FT	W230	Į.	Page 1 of 1	
CORPS OF ENGINEERS ENGINEERING SERVICES		Fort W	Vainw	right	, Alas	ka			C	Date: 25 Jan 2001	
Soils and Geology Section	Drilling Ag			080 /	Alask	a Dist	rict		Elevatio XI MS	n Datum: SL 🔲 other	
EXPLORATION LOG	Location:		thing ting:		09,16 24,14				Top of H Elevation		
Hole Number, Field: Permanent: AP-15 AP-7930	Driller: Bill Tes	ster			-		· · ·	Inspector: Steve He	enslee	4.5	
Type of Hole: other. Monitoring Well Pi	ezometer	Depth t			water.		······································	Depth Drille 7.5 m	ed:	Total Depth:	
Hammer Weight: Split Spoon I.D: Size and Type of 136 kg 63.5 mm 203.2 mm Rock	of Bit:				quipr Soil fi			<u> </u>	Type of S	<u> </u>	
		G	irain S			T	T	<u>_</u>			
Classification (m) Sample Sample ASIM D 4083 Frozen ASIM D 4083 Frost Class: TM 5-822-5 Symbol Symbol Symbol	488	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water		Oescripilo	n and Remarks	
Nbn Grab ML SILT			-			0.8	-	Black, frozi (NP) fines,	en to moist possibly fil	, coarse sand, nonplastic I	
F2 2 SM Silty SAND with Org	anics	23	54	23	38.1	0.6	22	wood, meta	il debris, di 37 m feet u	parse sand, NP fines, iller advanced from sing hydraulics only,	
F2 3 SM Silty SAND with Grad	vel	27	52	21	38.1	0.4	28		and, NP fin	ibrounded gravel, medium fines, some organics sibly fill	
9 GP Poorly graded GRAV Sand	EL with				50.8	1.6	100	Gray, wet, s sand	ubrounded	gravel, fine to coarse	
9 SW Well-graded SAND w	ith Gravel		., ,		25.4	0.5		Gray, wel, se sand	ubrounded 	gravel, fine to medium	
GP Poorty graded GRAVI	EL with				31.8	0.5		Gray, wet, su coarse sand Bottom of Ho		gravel, medium to	
9								Elevation Groundwater depth 4,18 m	129.0 m Encounter	red While Drilling: al	
10	Т	Project								Trials Mr ba	
lay 94 Prev. Ed. Obsolete APPENDI	- [Project: Hole Number: FAMILY HOUSING UPGRADE - FTW230 AP-7930									

,	F	F		a /			DISTRICT ENGINEERS	1	FAMIL Fort W					E - FT	W230			e 1 of 1
4			Delo c	_	ENGINE	EERIN	IG SERVICES	Drilling Age				laska				Elevat	Date	
							Section	☐ Othe	-		100 r	niaska	UISUI	LL		DE N		other
	E	XI	PL	OR	RAT	101	\ LOG	Location:		thing: ting:		09,163 24,215				Top of Elevati		136.0 m
	e Nu P-16	mber	, Field	:	Permai AP-7			Driller: Bill Test	er			······································			Inspector. Steve H	enslee		
	e of Test			other luger l	lole [☐ Mon	itoring Well 🔲 P	iezometer	epth (water: n WD			Depth Drill 7.5 m	ed:	-	Total Depth:
	nmer 136 kg	Weiq g	ght:	1 .	l Spoon 3.5 mm	I.D:	Size and Type					quipn Soil M			I.	Type of Grab	Sam	•
			1083	15.45	=		Classification ASTM: D 2487 or D 2	ADD	rain S	ize	(E)		Ţ <u></u>		Descrip	tion ar	nd Remarks	
Depth (m)	Lihalogy	Sample	Frozen ASTM D 4083	Frost Class. TM 5-822-5	Blow Count	Symbol	M-51ML D 2467 OF D 2	400	%Gravel	%Sand	%Fines	Max Size (mm)	PID (ppm)	% Water				
- 1		1	Nbn		Grab	ML	SILT					·	0.5					ne sand, nonplastic with rust, fill
- 2		2		F2	2 3 3 3	SM	Silty SAND		6	48	46	25.4	0.4	12	Brown, mo metallic ar		IP fines, rusted fill	
- 3		3:		F2	2 2 2 2	SM	Silty SAND		1	54	45	19.1	0.5	28	Brown, mo wood and			IP fines, trace of
- 5		4			8 9 10 10	sw	Well-graded SAND v	with Gravel	To the state of th			12.7	0.5	-	Gray, wel, sand	subround	ed gr	evel, fine to coarse
6		5			5 5 6 9	sw	Well-graded SAND v	vith Gravel				25.4	0.5		Gray, wet, s	subround	ed gra	vel, fine to coarse
8		6			6 9 8 10	sw	Well-graded SAND v	vith Gravel				31.8	0.5		1.2 m of her Gray, wet, s	-		vel, fine to coarse
9	7,77	i de la companya de							77777						Bottom of I	: 127.9 m er Encour m	atered	While Drilling: at
10							<u> </u>						.					٠
		19-E ev. E	d. Obs	olete				1	roject FAN		lous	ING U	PGRA	DE - F	TW230	•	Н	ole Number: AP-7931